April 2, 1935. A. W. ALTORFER 1,996,654

WASHING MACHINE

Filed May 21, 1925 2 Sheets-Sheet 1

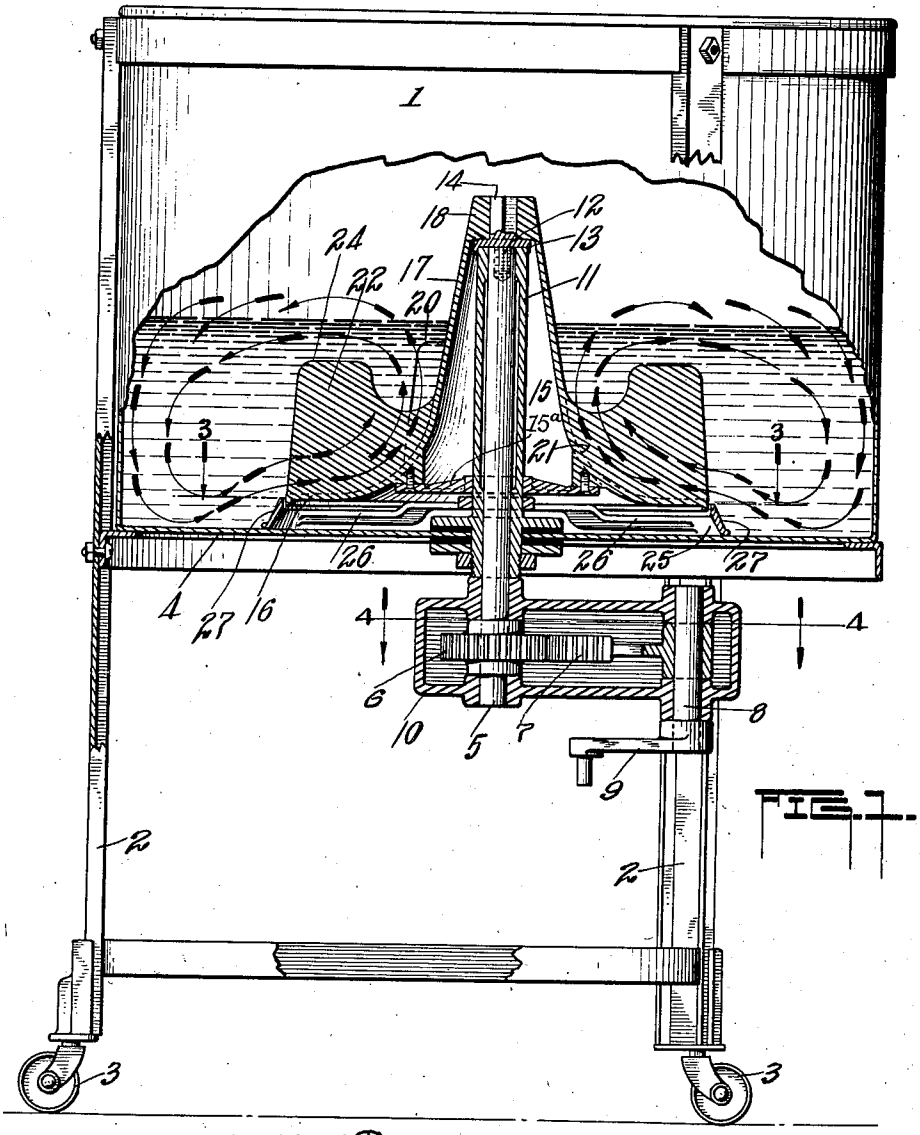


FIG. 1.

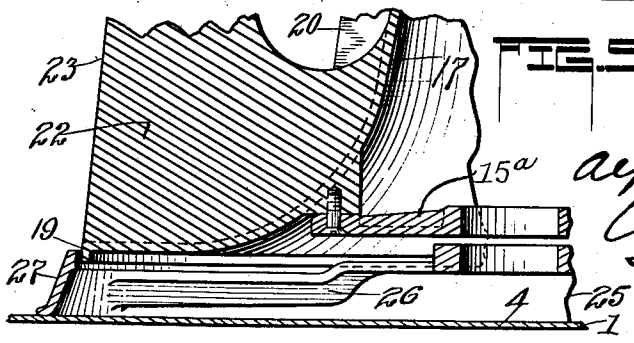


FIG. 5.

INVENTOR.

Alphens W. Altorfer

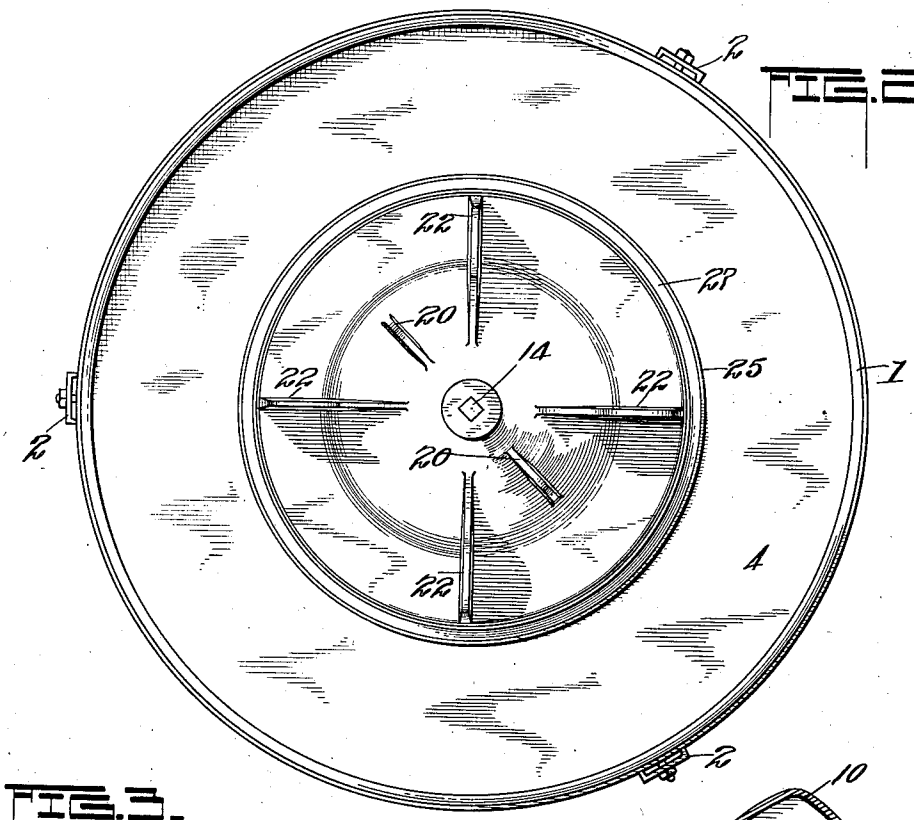
Chatfield Porter

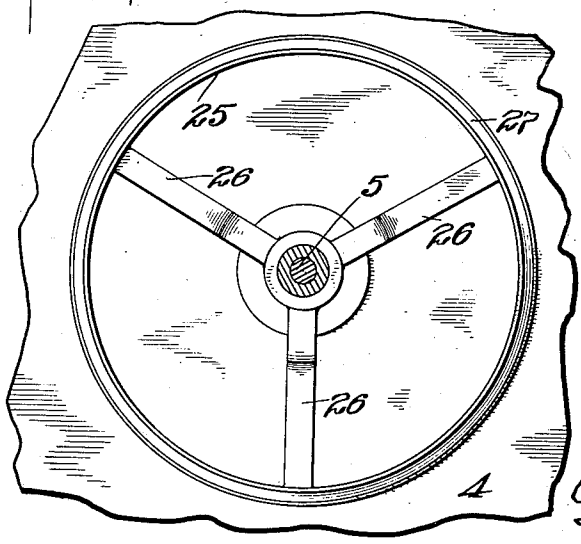
ATTY.

April 2, 1935. A. W. ALTORFER 1,996,654

WASHING MACHINE

Filed May 21, 1925 2 Sheets-Sheet 2





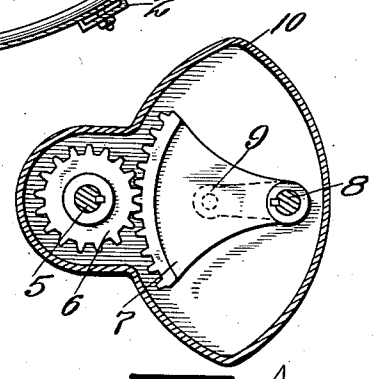


FIG. 4.

INVENTOR.

Alphens W. Altorfer

Chas. H. La Porte

ATTY

Patented Apr. 2, 1935

1,996,654

UNITED STATES PATENT OFFICE

1,996,654

WASHING MACHINE

Alpheus W. Altorfer, Peoria, Ill., assignor to Altorfer Bros. Company, East Peoria, Ill., a corporation of Illinois

Application May 21, 1925, Serial No. 31,807

41 Claims. (Cl. 259—101)

This invention has reference to washing machines, and it has for its principal object to improve the dolly or agitating means, whereby to produce a more effective and improved washing action on the articles deposited in the tub or container thereof.

The invention has for a further object to provide a dolly or agitating member operative from and by means of a shaft passing up through the bottom of the tub or container, and so constructed with radially arranged fins or baffle members and an intermediate surface inclined or curved upwardly from its peripheral edge, that the resultant action of the dolly or agitator, as it is oscillated is to cause the articles being washed to be moved toward the center of the dolly or agitating member and upwardly and thence outwardly and downwardly; or in other words impart to such articles a slow whirl like motion radially of the dolly or agitator and thereby more effectively cleanse the articles, by constant agitation and the forcing of air and water through the articles.

A further object of the invention is to provide in a washing machine, an oscillatory dolly or agitator so constructed, that it will act upon the articles being washed in a way as to cause said articles to circulate or whirl slowly in a direction radially of the tub and from and toward the center of the tub with a limited circular movement circumferentially of the tub; the centrifugal action set up by the oscillation of the dolly or agitator tends, or causes the articles as they rise to or above the water line, to recede from the center of the tub, thereby aiding in the radial circulation of such articles.

A further object of the invention is a shroud arranged on the bottom wall of the tub or container to prevent the articles being washed from getting under the dolly or agitator as it is oscillated and thereby tear or otherwise damage such articles; the surface of said shroud being preferably inclined upwardly, corresponding somewhat to the surface of the dolly or agitator between its fins or baffles to aid in directing the articles upwardly and toward the center of the dolly or agitator. Such a construction of dolly or agitator and shroud makes it possible to provide a tub or container with a comparatively larger surface area than is ordinarily found in washing machines of this character, and making it further possible to locate the dolly or agitator with its fins or baffles above the bottom wall of the tub and closer to the normal water line in which the articles are suspended, and thereby apply a more constant action of the dolly or agitator on the articles.

A still further object of the invention resides in the mounting for the dolly or agitator, whereby it is removable; to the manner of holding the shroud in position on the bottom wall of the tub or container and to the means for imparting oscillatory movement to said dolly or agitator.

That the invention may be more fully understood, reference is had to the accompanying drawings forming a part of the present description, illustrating a preferred embodiment of the invention, in which:—

Figure 1 is an elevation, in section, showing a washing machine embodying my invention;

Figure 2 is a top plan view;

Figure 3 is a plan view, partly in section, as the same would appear on the line 3—3, Figure 1;

Figure 4 is a detail plan in section, as the same would appear on the line 4—4, Figure 1, and

Figure 5 is an enlarged detail sectional view of a part of the dolly or container and shroud, showing how the peripheral edge of said dolly or shroud is protected against articles getting thereunder.

Like characters of reference denote corresponding parts throughout the figures.

The tub or container 1 is preferably cylindrical in shape, not unlike those in general use in machines of like character, except that it is made possible, with the use of a washing element, such as I show and describe, to provide a tub or container with a comparatively larger surface area than is ordinarily found in machines of this class. Said tub or container is supported by standards or legs 2 having the usual caster wheels 3. The bottom wall 4 of the tub, when using my improved dolly or agitator, may be substantially flat, as shown.

Extending upwardly through the bottom wall 4 of the tub is an operating shaft 5, and said shaft on its lower end has a gear wheel 6 engaged by a rack or segment gear 7 connected to and adapted to be oscillated back and forth by a shaft 8. Connected to said shaft 8 is a crank 9 arranged to be operated by suitable means, not shown, from any suitable source of power. The gear wheel 6 and the rack or segment gear 7 may be encased in any suitable housing 10.

The shaft 5 extends up through and has bearing in an enclosing stem or sleeve 11, open at its upper end and to the upper end of said shaft 5 is connected a coupling member 12 having a depending flange 13 encircling the upper end of the stem or casing 11 and the extended axial portion of

said member 12 is preferably square, as at 14, to provide a convenient mode of attaching the dolly or agitator, to be described, thereto, and to detach the same therefrom. The lower end of said stem or casing 11 passes through the bottom wall 4 of the tub or container, and any suitable means is employed to seal the connection between said stem or casing and said bottom wall to prevent leakage around said stem or casing.

The dolly or agitator is designated 15 and comprises a preferably annular base portion 16 and an upstanding preferably tapered tubular sleeve-like portion or post 17 with a shouldered throat 18 having a square opening arranged axially therein to fit over the squared extension of the coupling member 12 connected to the shaft 5. Such a construction provides a simple means by which the dolly or agitator may be attached to and detached from the shaft 5, the upper end of the casing 11 constituting a bearing for the dolly. A bearing is provided for the bottom of the dolly with said casing 11 by means of a member 15—*a*, forming a part of or being attached to the body of the dolly, see Figs. 1 and 5. The peripheral edge of the base portion 16 of the dolly or agitator is formed or provided, preferably with a bead 19 and from such peripheral edge the upper exposed face of the dolly or agitator slopes inwardly and upwardly, as at 21 merging into the sleeve-like portion or post 17, forming in effect a central cone-like structure and correspondingly providing a sweeping surface extending from said edge portion upwardly and inwardly to the post portion 17. Also formed or provided on the base 16 are a plurality of radially arranged, upstanding major agitator vanes, fins or baffles 22 which, as shown, extend inwardly from the peripheral edge of said dolly or agitator and merge or fade into the sleeve-like portion 17. These major fins or baffles, have their outer edges 23 preferably inclined slightly upwardly and inwardly and are formed with upper curved or arcuate ends 24 and then downwardly and inwardly toward the center of the dolly or agitator and then merge or fade into the sleeve-like portion 17. Arranged intermediately of certain of said major fins or baffles and disposed radially diametrically of each other, are a pair of supplemental agitator vanes, fins or baffles 20 having their upper ends preferably in a horizontal plane above the highest points of said fins or baffles 22 and their lower portions merging or fading into the curved surface of the base portion. Such supplemental fins or baffles extend longitudinally of the sleeve-like portion 17 and project a short distance therefrom and in operation tend to force the articles being washed outwardly, whereas the combined action of the curved surface of the dolly or agitator and fins or baffles 22 is to draw the articles inwardly and upwardly of the dolly or agitator. Combined with these actions is the centrifugal force set up by the oscillation of the dolly or agitator, which tends or causes the articles as they rise to or above the water line, to recede from the center of the tub, thereby aiding in the radial circulation of such articles. Furthermore, it is to be understood that with this slow whirling or radial circulation of the articles there is less chance of the articles becoming entangled and there is only a limited circular movement of the articles circumferentially of the tub and the articles thereby kept from being wound around the center stem or post of said dolly or agitator, as will be found in many of the different machines of this class.

As will be seen, the height to which the shaft 5 extends up into the tub or container 1 and the length or height of the dolly or agitator 16 which is carried thereby, inasmuch as it is supported from the upper end of said shaft, will determine the position of the fins or baffles in the water in the tub, or container, and the relative positions of such fins or baffles to the normal water line in the tub; also the position of the base of the dolly or agitator to the bottom wall of the tub. The post or stem connection formed between the shaft 5 and the dolly or agitator is such, that the upper end thereof is sufficiently far above the water, when agitated, to prevent leakage through the top of said stem.

Surrounding the lower base portion of said dolly or agitator is a shroud or guard 25, of preferably cast aluminum or the like. Said shroud preferably rests on the bottom wall of the tub or container and is also preferably held in fixed position by webs 26 having a central hub slipped down over the stem or casing 11 with a snug fit thereon, or brazed or soldered thereto, or otherwise suitably and conveniently held. The shroud is so located as to leave an annular exposed surface of the bottom of the tub beyond the shroud and cooperating therewith. This shroud has the form of an annular ring, as shown, with an inwardly and upwardly inclined surface wall 27. When the shroud and dolly or agitator are assembled, the upper edge of the shroud lies preferably above the lowermost base line of the dolly or agitator and preferably in the same horizontal plane with the lowermost upper surface of the base of said dolly or agitator. The relation these parts bear to each other is best seen, in detail, in Figure 5 and illustrates the practical impossibility of articles, being washed, getting under the edge of the dolly or agitator and being damaged, and further illustrates, in connection with Figure 1 the position in which it is possible to elevate the dolly or agitator, in its relation to the bottom wall of the tub and the relation of the fins or baffles to the normal water line. As the dolly or agitator is oscillated the articles are moved upwardly and inwardly and outwardly and downwardly, being given a slow whirl like action in a direction radially of the tub from and toward the center of said tub, with a limited circular movement circumferentially of the tub, tumbling the articles over each other, changing their positions and effectively forcing air and water therethrough. It is well understood that the rubbing together of the articles intensifies the cleansing, and this is accentuated by those parts of the articles coming together at or above the water line. By my improved washing action, produced by the peculiar arrangement and construction of the dolly or agitator, the articles are constantly being projected to or above the water line and caused to tumble and rub against each other and thereby the cleansing made more effective.

In Figure 1 I have illustrated the normal water line and the relation of the baffles of the dolly or agitator thereto and I have also shown by arrows the approximate movement of the articles in a radial direction toward and from the axis of the tub.

Summarizing, I have provided a new and improved method of washing clothes and other articles by means of an oscillating dolly wherein the clothes and other articles are drawn inwardly along the bottom of the tub and on to the dolly and are positively forced upwardly from the surface of the dolly along the axis thereof (which is

located in the central washing zone) to and above the normal water level in the tub; the clothes and other articles then being forced outwardly toward the sides of the tub and downwardly to the bottom. This action is secured by providing the dolly with baffle members, the effective operative surface areas of which are higher nearer the axis of the dolly than at the periphery thereof and by arranging the surface of the dolly with an incline extending upwardly well above the periphery of the dolly and at least to the top of the baffle members. Bringing the clothes and other articles inwardly to the center of the tub and forcing them upwardly causes a bunching of such articles at the center of the tub which further causes a squeezing and rubbing of the articles together aided by the oscillatory action of the dolly. This squeezing and rubbing action varies as the articles are moved outwardly until the articles are liberated in the water at the sides of the tub. The foregoing described action occurs when the washing machine contains a normal operating load; that is to say, the washing machine industry has come to recognize that too few clothes in a body of liquid are not properly cleansed and likewise too many clothes in a body of liquid are not properly cleansed, except possibly after long and excessive running of the machine. Accordingly there is a recognized proportion of clothes and water for proper and effective washing in a reasonable time and the action I have described above occurs when that proportion of water and clothes is used.

What I claim is:—

1. In a washing machine, a tub, a dolly supported to be oscillated therein, a shroud for the dolly, resting on the bottom wall of the tub and adapted to prevent articles from getting under the peripheral edge of said dolly, a plurality of radially arranged baffle members extending inwardly from the peripheral edge of said dolly, and a plurality of radially arranged baffle members extending up above said first mentioned baffles and lying within the peripheral edge of said dolly.

2. In a washing machine, a tub, an operating shaft extending up into said tub through the bottom wall thereof, an oscillatory dolly having a circular base portion and an upstanding sleeve-like portion meeting in an upwardly and inwardly curved surface, means to detachably connect said sleeve-like portion with the upper end of said shaft, a shroud for the dolly, resting on the bottom wall of the tub and adapted to prevent articles from getting under the peripheral edge of said dolly, a plurality of radially arranged baffle members extending inwardly from the peripheral edge of said dolly and merging into said sleeve-like portion, and other baffle members between certain of said first mentioned baffle members, and extending thereabove and longitudinally of said sleeve-like portion and radially therefrom, but short of the peripheral edge of said dolly.

3. In a washing machine, a tub having a bottom wall, a dolly supported to be oscillated above said bottom wall and provided with a plurality of baffle members, and a shroud enclosing the bottom of said dolly, said shroud having a sloping wall, the slope of said wall being of a different degree from the slope of the bottom of the dolly.

4. In a washing machine, a tub having a bottom wall, a dolly supported to be oscillated above said bottom wall and provided with a plurality of baffle members, and a shroud for said dolly resting on said bottom wall and having an inclined surface adapted to prevent articles from getting under the edge of said dolly.

5. In a washing machine, a tub, a dolly, means for imparting oscillatory motion to said dolly, baffle members on said dolly extending radially toward the periphery thereof and having portions near the axis of the dolly higher than portions at the periphery and terminating substantially below the top of the dolly and below the normal water level in the tub to insure complete submersion thereof.

6. In a washing machine, a tub, a dolly having a surface area inclined upwardly from the marginal edge of the dolly towards its axis and having vertically disposed baffle members on such surface, the operative areas of said members and the inclined surface of said dolly adapted to move articles in the tub inwardly over said inclined surface and upwardly axially of the dolly, and means for imparting oscillatory movement to said dolly.

7. In a washing machine, a tub having an opening centrally disposed in the bottom thereof, a vertical drive shaft projecting through said opening to a point above the normal water level in the tub and adjacent to the top thereof, a column surrounding said shaft and terminating adjacent the upper end thereof, said column having a watertight connection at the bottom of the tub, means for agitating the contents of the tub, said agitating means comprising a disk-like member arranged adjacent to the bottom of the tub, a plurality of agitating blades on the upper surface of said disk member, a central sleeve formed integral with said disk and projecting upwardly therefrom, means for positively connecting the upper end of said sleeve with the upper end of the drive shaft whereby the agitating means is driven from said shaft, and means for centering the said disk member about its vertical axis during actuation.

8. In a washing machine, a tub having an opening centrally disposed in the bottom thereof, a vertical drive shaft projecting through said opening to a point above the normal water level in the tub and adjacent to the top thereof, a column surrounding said shaft and terminating adjacent the upper end thereof, the said column having a watertight connection at the bottom of the tub, means for agitating the contents of the tub, the said agitating means comprising a disk-like member arranged adjacent to the bottom of the tub, a plurality of agitating blades on the upper surface of said disk member, a central sleeve formed integral with said disk and projecting upwardly therefrom a substantial distance, means for positively connecting the upper end of said sleeve with the upper end of the drive shaft whereby the agitator is driven from said shaft, and a bearing member for centering the lower end of said disk member during actuation.

9. In a washing machine, a tub, having an opening centrally disposed in the bottom thereof, a vertical drive shaft projecting through said opening to a point above the normal water level in the tub and adjacent to the top thereof, means for sealing said opening, and means for agitating the contents of the tub, said agitating means comprising a disk like member arranged adjacent to the bottom of the tub and having the periphery thereof spaced a substantial distance from the wall of the tub, a central sleeve projecting up-

wardly from said disk to a point adjacent the upper end of the drive shaft, means for positively connecting the upper end of said sleeve with the drive shaft whereby the agitating means is driven from said shaft.

10. In a washing machine, a tub having an opening centrally disposed in the bottom thereof, a vertical drive shaft projecting through said opening to a point above the normal water level in the tub and adjacent to the top thereof, housing and sealing means surrounding said shaft, and means for agitating the contents of the tub, said agitating means comprising a disklike member arranged adjacent to the bottom of the tub and being substantially smaller in diameter than the bottom of the latter, a central sleeve projecting upwardly from said disk to a point adjacent the upper end of the drive shaft, means for positively connecting the upper end of said sleeve with the drive shaft whereby the agitating means is driven from said shaft, and means for centering the agitator about its vertical axis.

11. In a washing machine, in combination, a clothes container, an agitator therein, a member extending upwardly from the agitator member to a point above the normal water level therein fashioned at its upper end to provide a driving connection for agitator operating means, a driving member for said agitator extending upwardly through the bottom of the container and fashioned at its upper end for detachable driving connection with the extension from the agitator member, means for reciprocating the agitator driving member, and a guard interposed between the agitator and the bottom of the tub and spaced from the side walls of the tub to prevent the entrance of extraneous matter beneath the agitator.

12. In a washing machine, in combination, a tub or container, an agitator member, a member extending upwardly therefrom fashioned at its upper end to provide a driving connection, for a driven member, a suitably supported driven member extending upwardly through the bottom of the container and through the extension member of the agitator fashioned at its upper end for driving engagement with said agitator extension, a guard element interposed between the agitator member and the bottom of the tub, and means for reciprocally driving said driven member, a sleeve member projecting upwardly from the guard element to a point above the normal water line and surrounding the driven member.

13. A washing machine having in combination a container, an agitator within said container, a member interposed between said agitator and the bottom of the container, the said member being adapted to prevent the entrance of extraneous matter beneath the agitator, and means for reciprocating the agitator.

14. A washing machine having in combination a tub, a driving member projecting through the bottom of the tub to a point above the normal water line thereof, an agitator adjacent the bottom of the tub, means for supporting the agitator from the upper extremity of the driving member, and means directly associated with the agitator and the bottom of the tub to prevent lateral movement of the agitator.

15. A washing machine having in combination a container, an agitator within the container and adjacent the bottom thereof, means for reciprocating the agitator and means interposed between said agitator and the bottom of the container to center the agitator and prevent lateral movement thereof.

16. A washing machine having in combination, a tub, a driven member extending upwardly therein to a point above the normal water line, an agitator actuated by said driven member and detachable therefrom by a vertical lift, said agitator comprising a main laterally extending body portion disposed adjacent the bottom of the tub, and a sleeve member extending upwardly from the main body portion to a point above the normal water line of the tub, the upper end of said sleeve being driven and centered by said driving member and a member engaging said laterally extending body portion for centering the lower portion of the agitator against lateral movement.

17. A washing machine having in combination a tub, provided with a central opening in the bottom thereof, a tubular member within the tub in axial alignment with said opening, the said tubular member projecting upwardly to a point above the normal water line of said tube, a driving member projecting through the opening in the bottom of the tub and the tubular member to a point beyond the upper end of said member, an agitator located adjacent the bottom of the tub, a sleeve member connected to the agitator and spaced from the tubular member, means for connecting the upper end of the sleeve member to the upper end of the driving member, and guarding and centering means directly associated with the said agitator adapted to prevent lateral movement of the agitator and exclude the entrance of foreign matter thereunder.

18. In a washing machine, a tub having an opening in its bottom, a drive shaft projecting upwardly through said opening to point above the normal water level in the tub, an agitating means within the tub having a bottom portion arranged adjacent the bottom of the tub with the periphery thereof spaced a substantial distance from the wall of the tub, the said bottom portion having integral therewith an upstanding member projecting to a point above the normal water level in the tub, the wall of said member presenting an exteriorly tapered surface downwardly and outwardly flared into said bottom portion to constitute therewith a continuous sloping surface, upstanding radially arranged blades on the agitating means, a driving connection between the upper end of the drive shaft and said member located at a point above the normal water level in the tub, and means located adjacent the bottom of the agitating means and forming a centering device for the agitating means.

19. In a washing machine, a tub having an opening axially disposed through its bottom, a drive shaft projecting upwardly through said opening to a point above the normal water level in the tub, an agitating means within the tub including a disk-like member arranged adjacent the bottom of the tub and having the periphery thereof spaced a substantial distance from the wall of the tub, the said disk-like member having integral therewith an upstanding hollow part projecting to a point above the normal water level in the tub, the wall of said hollow part having a cone-like formation presenting an exteriorly tapered surface merging into its disk at points thereabout considerably removed from the axis of the disk, upstanding radially arranged blades on the surface of the disk-like member the upper portions of which are below the normal water level in the tub, and means providing a driving connection between the upper end of the drive

shaft and said hollow part at a point removed above the normal water level in the tub.

20. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, said edge portion terminating in a circumferential depending part, and said base portion being provided with agitating means projecting upwardly from the base portion; said dolly being provided with means for operative association with a drive projecting upwardly from the bottom of a tub.

21. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, said edge portion terminating in a circumferential depending part, and said base portion being provided with agitating means projecting upwardly from the base portion, in combination with a high center post connected to the base portion and projecting upwardly therefrom, adapted to prevent tangling of the articles in the zone centrally above the dolly; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

22. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, said base portion being provided with agitating means projecting upwardly from the base portion, in combination with a high center post connected to the base portion and projecting upwardly therefrom adapted to prevent tangling of the articles in the zone centrally above the dolly, and vane portions extending longitudinally of said post to a distance substantially beyond the operating area of said agitating means; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

23. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, said edge portion terminating in a circumferential depending part, said base being provided with agitating means projecting upwardly from the base portion, in combination with a high center post connected to the base portion and projecting upwardly therefrom adapted to prevent tangling of the articles in the zone centrally above the dolly, and vane portions extending longitudinally of said post to a distance substantially beyond the operating area of said agitating means; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

24. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, and said base portion being provided with agitating means projecting upwardly from the base portion, in combination with a high center post connected to the base portion and projecting upwardly therefrom adapted to prevent tangling of the articles in the zone centrally above the dolly; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

25. A dolly formed and adapted for machines for washing clothes or fabric articles, comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, and said base portion being provided with agitating means projecting upwardly from the base portion, in combination with a high center post connected to the base portion and projecting upwardly therefrom adapted to prevent tangling of the articles in the zone centrally above the dolly, the exterior surface of the center post flaring outwardly and downwardly and merging with the exposed upper face of the base portion to constitute a continuation of said sweeping surface; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

26. In a washing machine, a tub, a dolly therein formed and adapted for washing clothes or fabric articles, comprising a base portion having its upper exposed face flaring downwardly and outwardly from a relatively elevated point to a relatively low marginal edge portion, agitating means extending upwardly from said base portion, and a high center post connected to and projecting upwardly from said base portion and extending well into the zone centrally above the dolly to prevent tangling of the articles correspondingly centrally of the tub, in combination with an operating shaft driven from below the tub and projecting upwardly from the bottom of the tub, and a driving connection between said post and said shaft.

27. In a washing machine, a tub, a dolly therein formed and adapted for washing clothes or fabric articles, comprising a base portion having its upper exposed face flaring downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion, agitating means extending upwardly from said base portion, and a high center post connected to and projecting upwardly from said base portion to extend well into the zone centrally above the dolly to prevent tangling of the articles correspondingly centrally of the tub, in combination

with an operating shaft driven from below the tub and projecting upwardly from the bottom of the tub, a driving connection between said post and said shaft, and a bearing located inwardly of the dolly for centralizing the same.

28. In a washing machine, a tub, a dolly therein formed and adapted for washing clothes or fabric articles, comprising a base portion having its upper exposed face flaring downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion, agitating means extending upwardly from said base portion, and a high center post connected to and projecting upwardly from said base portion to extend well into the zone centrally above the dolly to prevent tangling of the articles correspondingly centrally of the tub, in combination with an operating shaft driven from below the tub and projecting upwardly through the bottom of the tub, a driving connection between said post and said shaft, and a bearing located inwardly of the dolly for centralizing the same, said bearing including a sleeve between the shaft and dolly and its post and a bearing part on the dolly operatively effective against said sleeve.

29. In a washing machine, a tub, a dolly formed and adapted to wash clothes or fabric articles, comprising a base portion flaring downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion, said base being in part of hollow formation, a center post connected to the dolly and projecting upwardly therefrom, a sleeve projecting upwardly from the bottom of the tub, and a bearing member positioned inwardly relative to the dolly enabling rotation on the sleeve while assisting in stabilizing the dolly.

30. In a washing machine, a tub, a dolly formed and adapted to wash clothes or fabric articles, comprising a base portion flaring downwardly and outwardly from a relatively elevated central point to a relatively low marginal portion, said base being in part of hollow formation, a center post connected to the dolly and projecting upwardly therefrom, a sleeve projecting upwardly from the bottom of the tub, and a bearing member positioned inwardly relative to the dolly enabling rotation on the sleeve while assisting in stabilizing the dolly, the center post being of high character to project upwardly from the dolly into the zone centrally above the dolly and adapted to prevent tangling of the articles in the corresponding central zone of the tub.

31. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a base portion the upper exposed surface of which flares downwardly and outwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, and correlated portions associated with the body portion of the dolly and tub acting to prevent the entrance of clothes beneath the dolly, in combination with means for securing relative oscillatory movement between the tub and dolly.

32. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a base portion the upper exposed surface of which flares outwardly and downwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, and correlated portions associated with the body portion of the dolly and tub acting to prevent the entrance of articles beneath the dolly, said correlated portions comprising a depending part at the marginal portion of the body of the dolly and an overlapping part associated with the base of the tub, in combination with means for securing relative oscillatory movement between the tub and dolly.

33. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a base portion the upper exposed surface of which flares outwardly and downwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, and correlated portions associated with the body portion of the dolly and tub acting to prevent the entrance of clothes beneath the dolly, said correlated portions comprising a depending part at the marginal portion of the body of the dolly and an overlapping part associated with the base of the tub, in combination with a low bearing for the dolly effective at a point adjacent the bottom of the tub, and means for securing relative oscillatory movement between the tub and dolly.

34. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a base portion the upper exposed surface of which flares outwardly and downwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, and correlated portions associated with the body portion of the dolly and tub acting to prevent the entrance of articles beneath the dolly, said correlated portions comprising a depending part at the marginal portion of the body of the dolly and an overlapping part associated with the base of the tub, the dolly having a center post of substantial length extending upwardly to a relatively high point in the tub and beyond the operating area of said agitating means, adapted to prevent tangling of the articles in a zone centrally above the dolly and correspondingly centrally of the tub, in combination with means for securing relative oscillatory movement between the tub and dolly.

35. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a base portion the upper exposed surface of which flares outwardly and downwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, and correlated portions associated with the body portion of the dolly and tub acting to prevent the entrance of articles beneath the dolly, said correlated portions comprising a depending part at the marginal portion of the body of the dolly and an overlapping part associated with the base of the tub, in combination with a low bearing for the dolly effective at a point adjacent the bottom of the tub, the dolly having a central post of substantial length extending upwardly to a relatively high point in the tub and beyond the operating area of said agitating means adapted to prevent tangling of the articles in a zone centrally above the dolly and correspondingly centrally of the tub, and means for securing relative oscillatory movement between the tub and dolly.

36. In a washing machine, a dolly therein formed and adapted to wash clothes or fabric articles, comprising a body portion the exposed face of which flares downwardly and outwardly

from a relatively elevated point to a relatively low marginal edge portion, said base portion being provided with a part projecting below said flaring base portion, and the bottom of the tub being provided with means correlated to said projecting portion to exclude articles from beneath the dolly, in combination with means for securing relative oscillatory movement between the tub and dolly.

37. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a body portion the exposed face of which flares downwardly and outwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, said base portion being provided with a part projecting below said flaring base portion, and the bottom of the tub being provided with means correlated to said projecting portion to exclude articles from beneath the dolly, the dolly having a central post of substantial length extending upwardly to a relatively high point in the tub and beyond the operating area of said agitating means adapted to prevent tangling of the articles in the zone centrally above the dolly and correspondingly centrally of the tub, in combination with means for securing relative oscillatory movement between the tub and dolly.

38. In a washing machine, a tub, and a dolly therein formed and adapted to wash clothes or fabric articles, comprising a body portion the exposed face of which flares downwardly and outwardly from a relatively elevated point to a relatively low marginal edge portion, upwardly extending agitating means on said base portion, said base portion being provided with a part projecting below said flaring base portion, and the bottom of the tub being provided with means correlated to said projecting portion to exclude articles from beneath the dolly, the dolly having a central post of substantial length extending upwardly to a relatively high point in the tub and beyond the operating area of said agitating means adapted to prevent tangling of the articles in the zone centrally above the dolly and correspondingly centrally of the tub, in combination with a drive shaft, a sleeve through which the drive shaft passes, a bearing between the sleeve and the shaft adjacent the upper end of the sleeve, and a bearing between the sleeve and the dolly adjacent the lower end of the sleeve.

39. A dolly formed and adapted for machines for washing clothes or fabric articles comprising a base portion the upper exposed face of which flares downwardly and outwardly from a relatively elevated central point to a relatively low marginal edge portion to provide a radially disposed sweeping surface extending inwardly and upwardly substantially from said edge portion to said central point, and said base portion being provided with agitating means projecting upwardly from the base portion, said base portion having a high center post projecting upwardly therefrom adapted to prevent tangling of the articles in the zone centrally above said base portion; and means enabling said base portion and its post to be operatively associated whereby to be actuated by a drive projecting upwardly from the bottom of a tub.

40. In a washing machine, a tub, a dolly adapted to be oscillated above the bottom of the tub and having a surface upwardly inclined toward its axis, an operating shaft extending upwardly through the bottom of the tub and having a driving connection with the dolly, a casing surrounding the shaft, a member cooperating with the peripheral edge of the dolly to prevent articles from getting under the dolly, said member having a circumferential surface upwardly inclined toward the axis of the dolly and outwardly and downwardly to the bottom of the tub and having means engaging the casing to hold said member concentric with said dolly.

41. In a washing machine, a tub, a dolly supported within the tub and having an upwardly and inwardly sloping surface leading from the marginal edge of the dolly, means to oscillate said dolly alternately in opposite directions, said dolly having agitating means, said agitating means and said sloping surface being correlated to cause articles in the tub to move in a substantially radial direction outwardly away from the axis of the dolly at and above the normal water level in the tub downwardly toward the sloping surface thereof and thence upwardly over the sloping surface axially of the dolly.

ALPHEUS W. ALTORFER.